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Original Article

Patient Perspectives on Laparoscopic Versus Open Surgery: A Cross-Sectional Comparative Study of Knowledge, Attitude, Risk Perception, and Acceptance in a Tertiary Care Setting

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Abstract

Background: Laparoscopic surgery offers significant clinical advantages over open surgery; however, patient perception and acceptance remain variable, particularly in developing healthcare settings.
Methods: A cross-sectional comparative study was conducted among 350 patients at a tertiary care centre in Maharashtra, India. Participants were equally divided into laparoscopic (n = 175) and open surgery (n = 175) groups. Data were collected using a structured, pre-validated questionnaire assessing knowledge, attitude, risk perception, and satisfaction. Statistical analysis included independent t-test, chi-square test.
Results: Patients in the laparoscopic group demonstrated significantly higher awareness (82.9% vs. 61.7%), knowledge scores (4.12 ± 0.63 vs. 3.45 ± 0.71), and more favourable attitudes (4.18 ± 0.62 vs. 3.52 ± 0.74) (p = 0.001). Risk perception was lower (2.41 ± 0.81 vs. 3.12 ± 0.88), and overall satisfaction was higher (4.29 ± 0.55 vs. 3.28 ± 0.68) (p = 0.001). Knowledge, positive attitude, and prior laparoscopic experience significantly predicted acceptance, while higher perceived risk reduced acceptance.
Conclusion: Laparoscopic surgery is associated with better patient perception and satisfaction. Enhancing awareness and addressing perceived risks may improve acceptance and promote patient-centred surgical care.

Keywords: *Laparoscopic surgery, Open surgery, Patient perception, Knowledge, Attitude, Risk perception, Patient satisfaction, Minimally invasive surgery, Surgical preference*

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Introduction

Over the past few decades, surgical practice has undergone a significant transformation with the advent of minimally invasive techniques.[1] Laparoscopic surgery has emerged as a preferred alternative to conventional open procedures due to its well-documented advantages, including reduced postoperative pain, shorter hospital stays, faster recovery, and improved cosmetic outcomes.[2,3] As a result, it has become the standard of care for several elective surgical procedures worldwide.

Despite these advantages, the adoption and acceptance of laparoscopic surgery are not uniform across all patient populations.[4,5] In many developing healthcare settings, including India, factors such as limited awareness, socioeconomic constraints, perceived risks, and accessibility continue to influence patient preferences and decision-making.[6,7] Furthermore, misconceptions regarding safety, cost, and the need for conversion to open surgery may contribute to hesitation in accepting minimally invasive approaches.[8]

Patient-centred care emphasizes the importance of understanding individuals' knowledge, attitudes, and perceptions when evaluating healthcare interventions. In surgical practice, patient perception plays a crucial role not only in treatment acceptance but also in satisfaction and postoperative outcomes.[9,10] While numerous studies have compared clinical outcomes between laparoscopic and open surgeries, there remains a relative paucity of data exploring patient perspectives, particularly in the Indian context.[11,12]

Assessing patient awareness, attitudes, and satisfaction is essential for identifying gaps in knowledge and addressing barriers to the wider adoption of laparoscopic techniques.[13] Such insights can guide targeted educational interventions, improve doctor–patient communication, and ultimately enhance the quality of surgical care delivery.[14-16]

Therefore, the present study was undertaken to compare the knowledge, attitude, risk perception, and acceptance of laparoscopic versus open surgery among patients attending a tertiary care centre. Additionally, the study aimed to identify factors influencing the acceptance of laparoscopic surgery, thereby providing evidence to support patient-centred surgical decision-making.

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Methods

Study Design and Setting
A cross-sectional comparative study was conducted over a period of two months at a tertiary care (Level III) healthcare centre in Maharashtra, India. Prior to initiation, ethical approval was obtained from the Institutional Ethics Committee, and the study was carried out in accordance with established ethical standards.

Study Population and Sampling
A total of 350 participants were enrolled and equally allocated into two groups: individuals undergoing or having undergone laparoscopic surgery (n = 175) and those undergoing or having undergone open surgical procedures (n = 175). Participants were recruited from the General Surgery outpatient department using a convenience sampling technique.

Eligibility Criteria
Inclusion criteria:
- Adults aged ≥18 years
- Patients undergoing or with a history of elective surgical procedures
- Individuals capable of understanding and responding to the questionnaire
- Willingness to participate, as indicated by informed consent

Exclusion criteria:
- Patients undergoing emergency surgical procedures
- Individuals who declined participation
- Patients with cognitive impairment or inability to provide reliable responses

Data Collection Instrument
Data were collected using a structured and pre-validated questionnaire administered through Google Forms. To enhance comprehension and inclusivity, the questionnaire was made available in both English and the local language.
The questionnaire comprised four domains:
Knowledge: Assessed participants' awareness of laparoscopic and open surgical techniques, sources of information (including healthcare professionals, media, and peers), and understanding of potential benefits such as reduced postoperative pain, faster recovery, and improved cosmetic outcomes.
Attitude: Evaluated willingness to undergo laparoscopic versus open surgery, level of trust in minimally invasive techniques, and preference for newer surgical modalities over conventional approaches.
Risk Perception: Explored perceived risks associated with laparoscopic surgery, including concerns related to complications, anaesthesia, carbon dioxide insufflation, safety, conversion to open surgery, and financial burden.
Practice and Acceptance: Included prior surgical experience (laparoscopic or open), satisfaction across domains such as pain, recovery, cosmesis, cost, and overall care, as well as future preference for surgical modality.

Scoring System
Responses for attitude, risk perception, and satisfaction domains were recorded using a 5-point Likert scale ranging from 1 to 5 (1 = strongly disagree/very dissatisfied; 5 = strongly agree/very satisfied).
For statistical analysis, Likert scale responses were treated as continuous variables and expressed as mean ± standard deviation (SD). For regression analysis, responses were dichotomized into "satisfied" (scores 4–5) and "not satisfied" (scores 1–3).

Statistical Analysis
Data were entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS), version 20.0.
Descriptive statistics were presented as frequencies, percentages, and mean ± SD. Comparative analysis between the two groups was performed using the independent samples t-test for continuous variables and the chi-square test for categorical variables. Binary logistic regression analysis was conducted to identify factors influencing acceptance of laparoscopic surgery, with results expressed as Odds Ratios (OR) and 95% Confidence Intervals (CI). A p-value of <0.05 was considered statistically significant.

Ethical Considerations
A prior approval from the Institutional Ethics Committee was taken (NKPSIMS & RC and LMH/**IEC/07/2025**). Informed consent was obtained from all participants prior to inclusion. Participant confidentiality and anonymity were strictly maintained throughout the study, and data were used solely for research analysis purposes.

Results

Participant Characteristics
A total of 350 participants were included in the study, with 175 individuals each in the laparoscopic and open surgery groups. The mean age of participants was comparable between the two groups (42.6 ± 13.2 years vs. 44.1 ± 14.0 years; p = 0.28).
Male participants constituted 58.3% of the study population, with no statistically significant difference in gender distribution (p = 0.47). Educational status and socioeconomic background were also comparable between the groups ($p > 0.05$), indicating baseline homogeneity (Table 1).

Table 1. Baseline Demographic Characteristics of Study Participants

Variable	Laparoscopic Group (n = 175)*	Open Surgery Group (n = 175)*	p-value**
Age (years), mean ± SD	42.6 ± 13.2	44.1 ± 14.0	0.28
Gender (Male), n (%)	102 (58.3%)	102 (58.3%)	0.47
Gender (Female), n (%)	73 (41.7%)	73 (41.7%)	
Education (≥ Graduate), n (%)	98 (56.0%)	91 (52.0%)	0.45
Socioeconomic Status (Middle/Upper), n (%)	112 (64.0%)	106 (60.6%)	0.52

**Values are expressed as mean ± SD or number (percentage).*
***$p < 0.05$ considered statistically significant.*

Knowledge Regarding Surgical Techniques

Awareness of laparoscopic surgery was significantly higher in the laparoscopic group (82.9%) compared to the open surgery group (61.7%) ($p = 0.001$).

Participants in the laparoscopic group demonstrated significantly better knowledge scores (4.12 ± 0.63 vs. 3.45 ± 0.71; $p = 0.001$), along with greater understanding of benefits such as reduced postoperative pain, faster recovery, and improved cosmetic outcomes.

Healthcare professionals were the most common source of information (54.2%), followed by media (28.6%) and peers (17.2%).

Attitude and Risk Perception

The laparoscopic group exhibited a significantly more favourable attitude towards minimally invasive surgery (4.18 ± 0.62 vs. 3.52 ± 0.74; $p = 0.001$).

Risk perception scores were significantly lower in the laparoscopic group (2.41 ± 0.81) compared to the open surgery group (3.12 ± 0.88), indicating fewer perceived concerns ($p = 0.001$).

A significantly higher proportion of participants in the laparoscopic group expressed willingness to undergo laparoscopic surgery in the future (76.6% vs. 49.7%; $p = 0.001$) (Table 2).

Table 2. Knowledge, Attitude, and Risk Perception Comparison

Parameter	Laparoscopic Group*	Open Surgery Group*	p-value**
Awareness of laparoscopy, n (%)	145 (82.9%)	108 (61.7%)	0.001
Knowledge Score (mean ± SD)	4.12 ± 0.63	3.45 ± 0.71	0.001
Attitude Score (mean ± SD)	4.18 ± 0.62	3.52 ± 0.74	0.001
Risk Perception Score (mean ± SD)	2.41 ± 0.81	3.12 ± 0.88	0.001
Willingness for laparoscopy, n (%)	134 (76.6%)	87 (49.7%)	0.001

**Values are expressed as mean ± SD or number (percentage).*
***p < 0.05 considered statistically significant.*

Practice and Satisfaction Outcomes

Participants in the laparoscopic group reported significantly higher satisfaction across all evaluated domains, including pain, recovery, and cosmetic outcomes.

Overall satisfaction was significantly greater in the laparoscopic group (4.29 ± 0.55) compared to the open surgery group (3.28 ± 0.68; $p = 0.001$).

Additionally, a higher proportion of participants in the laparoscopic group preferred laparoscopic surgery for future procedures (79.4% vs. 52.0%; $p = 0.001$) (Table 3).

Table 3. Satisfaction Outcomes Between Groups

Parameter	Laparoscopic Group*	Open Surgery Group*	p-value**
Pain Score (mean ± SD)	4.32 ± 0.58	3.21 ± 0.71	0.001
Recovery Score (mean ± SD)	4.41 ± 0.52	3.34 ± 0.69	0.001
Cosmetic Outcome (mean ± SD)	4.48 ± 0.50	3.02 ± 0.76	0.001
Overall Satisfaction (mean ± SD)	4.29 ± 0.55	3.28 ± 0.68	0.001
Future Preference (Laparoscopy), n (%)	139 (79.4%)	91 (52.0%)	0.001

**Values are expressed as mean ± SD or number (percentage).*
***p < 0.05 considered statistically significant.*

Factors Influencing Acceptance of Laparoscopic Surgery

Binary logistic regression analysis demonstrated that higher knowledge scores (OR: 2.34; 95% CI: 1.62–3.38; $p = 0.001$), positive attitude (OR: 3.12; 95% CI: 2.01–4.84; $p = 0.001$), and prior laparoscopic experience (OR: 2.76; 95% CI: 1.74–4.39; $p = 0.001$) were significant predictors of acceptance of laparoscopic surgery.

Conversely, higher perceived risk was negatively associated with acceptance (OR: 0.58; 95% CI: 0.41–0.81; $p = 0.002$), while financial concern was not found to be statistically significant ($p = 0.54$) (Table 4).

Table 4. Binary Logistic Regression Analysis

Variable	Odds Ratio (OR)	95% Confidence Interval	*p-value
Knowledge Score	2.34	1.62 – 3.38	0.001
Positive Attitude	3.12	2.01 – 4.84	0.001
Prior Laparoscopic Experience	2.76	1.74 – 4.39	0.001
Risk Perception	0.58	0.41 – 0.81	0.002
Financial Concern	0.89	0.61 – 1.29	0.54

**p < 0.05 considered statistically significant.*

Reliability Analysis of the Questionnaire

The internal consistency of the questionnaire was assessed using Cronbach's alpha. The overall reliability coefficient was 0.81, indicating good internal consistency.

Domain-wise reliability was as follows: knowledge ($\alpha = 0.76$), attitude ($\alpha = 0.83$), risk perception ($\alpha = 0.79$), and satisfaction ($\alpha = 0.85$), demonstrating acceptable to high reliability across all domains.

Discussion

The present study provides a comprehensive comparison of patient knowledge, attitudes, risk perception, and acceptance of laparoscopic versus open surgery in a tertiary care setting. The findings demonstrate that patients exposed to laparoscopic surgery exhibit significantly higher awareness, more favourable attitudes, lower perceived risk, and greater overall satisfaction compared to those undergoing open surgical procedures like study by M. Patil et al.[2]

A key observation from this study is the significantly higher level of awareness regarding laparoscopic surgery among patients in the laparoscopic group. This likely reflects prior exposure to counselling, surgeon interaction, or personal experience.[17] Healthcare professionals emerged as the primary source of information, highlighting the pivotal role of clinicians in shaping patient perceptions. This underscores the importance of effective preoperative counselling in improving awareness and facilitating informed decision-making. A study by Almutary et al shows similar results with nurses' perception.[18]

The study further revealed that patients in the laparoscopic group had a markedly more positive attitude towards minimally invasive surgery. This aligns with existing literature suggesting that perceived benefits such as reduced pain, faster recovery, and improved cosmetic outcomes strongly influence patient preference.[19] Conversely, patients in the open surgery group demonstrated relatively lower acceptance, which may be attributed to limited knowledge and persistent misconceptions regarding laparoscopic procedures. Similar results are observed in study by Mahmoud et al[4] on comparing open and laparoscopic surgery on patients with colorectal cancer.

Risk perception was significantly higher among patients in the open surgery group, with concerns related to complications, anaesthesia, and the possibility of conversion to open surgery being more prevalent.[20] These findings highlight an important psychological barrier to the adoption of minimally invasive techniques. Notably, despite the technological advancement and established safety profile of laparoscopy, patient apprehension remains a critical factor influencing surgical choice. Similar safety concerns were highlighted by Madhok et al[21] in their narrative review.

Satisfaction outcomes were consistently higher among patients who underwent laparoscopic surgery across all domains, including pain, recovery, and cosmetic results. These findings reinforce the well-established clinical advantages of laparoscopic techniques and demonstrate that these benefits are clearly perceived and valued by patients. The higher overall satisfaction and greater preference for future laparoscopic procedures further support its role as a patient-preferred modality.[22-24]

Importantly, logistic regression analysis identified knowledge, positive attitude, and prior laparoscopic experience as significant predictors of acceptance of laparoscopic surgery, while higher perceived risk negatively influenced acceptance. These findings emphasize that patient acceptance is multifactorial and modifiable.[25] Similar to studies by Jeganathan et al[1] and T Kibria et al[6], our study suggests that enhancing awareness and addressing misconceptions could significantly improve the uptake of minimally invasive approaches. Interestingly, financial concern was not found to be a significant predictor, suggesting that perceived clinical benefits may outweigh cost considerations in influencing patient choice.

The reliability analysis demonstrated good internal consistency of the questionnaire, supporting the validity of the findings and strengthening the methodological rigor of the study.

From a clinical perspective, these findings highlight the need for structured patient education and counselling strategies aimed at improving awareness and addressing unfounded fears related to laparoscopic surgery. Surgeons and healthcare systems should focus on clear communication regarding the safety, benefits, and potential risks of minimally invasive procedures to enable informed, patient-centred decision-making.

This study also has certain **limitations**. Being a single-centre study, the findings may not be generalizable to all settings. The use of convenience sampling may introduce selection bias. Additionally, self-reported responses are subject to response bias and may be influenced by individual perception and recall. The cross-sectional design also limits the ability to establish causal relationships.

Conclusion

In conclusion, laparoscopic surgery is associated with higher patient awareness, more favourable attitudes, lower perceived risk, and significantly greater satisfaction compared to open surgery. Knowledge, attitude, and prior experience are key determinants of acceptance, while perceived risk acts as a barrier.

Targeted patient education and effective clinician–patient communication are essential to improve acceptance and optimize the utilization of minimally invasive surgical techniques in routine clinical practice.

Declarations

Ethical Approval and Consent to Participate: The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee (IEC/07/2025) prior to the commencement of the study. Informed consent was obtained from all participants after explaining the purpose and procedures of the study.

Consent for Publication: Not applicable.

Availability of Data and Materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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